

COULOMB POTENTIAL EFFECT ON CARRIER ENVELOPE PHASE DEPENDENT (CEP) STRONG-FIELD IONIZATION

EMMANUEL AYORINDE ORUNESAJO, YASASHRI RANGANATH RANATHUNGA, *Chemistry Department, Wayne State University, Detroit, MI, USA*; TEMITAYO OLOWOLAFE, *Chemistry, Wayne State University, Detroit, MI, USA*; SUK KYOUNG LEE, *Chemistry Department, Wayne State University, Detroit, MI, USA*; WEN LI, *Department of Chemistry, Wayne State University, Detroit, MI, USA*.

To achieve a better understanding of strong-field dynamics, the role of Coulomb-potential of the parent ion must be taken into consideration. Several theoretical studies have investigated the effect of coulomb on CEP dependence strong field ionization. However, there are still limited experimental studies on the impact of coulomb potential on the CEP dependent momentum distributions of the photoelectrons. In this work, we experimentally investigated the effect of the long-range and short-range Coulomb potential effect on the phase dependent momentum distributions of photoelectrons by subjecting different gases to the same laser conditions using phase-resolved coincidence imaging technique. The study was performed using both linear and circular polarized light. Our experimental results show that the CEPs at which the low energy electrons have the highest asymmetry is strongly influenced by the ionization potentials but not the electronic structures. This suggests that the long-range potentials are at play. On the contrary, in the case of high-energy electrons, the CEP dependent measurement is mainly governed by the short-range coulomb potential and thus sensitive to the electronic structure of the gas being ionized. These results show that the CEP dependent momentum distributions can be a sensitive probe of the Coulomb potentials.